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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,917	10/24/2003	Linfang Zhu	224713	9043

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/692,917

Applicant(s)

ZHU ET AL.

Examiner

Callie E. Shosho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/24/03</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### **Information Disclosure Statement**

1. Application Nos. 09/578,702, 09/579,519, 10/314,163, and 08/787,405 have been stricken from the IDS since these applications are not available to the public. However, it is noted that Application No. 09/578,702, 09/579,519, and 08/787,405, now U.S. Patent 6,726,756, 6,645,280, and 6,747,072, respectively, have been considered and each patent cited on the 892 form. Further, Application No. 10/314,163 has been considered and the "Search Notes" of the instant file wrapper has been annotated to this effect. Additionally, the PG Publication corresponding to 10/314,163 is cited on the 892 form.

### **Claim Rejections - 35 USC § 103**

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-3, 5-18, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (U.S. 6,221,933) in view of Mead et al. (U.S. 5,596,027) and Elmer et al. (U.S. 2005/0101694).

Zhu et al. disclose ink jet ink comprising up to 95% organic solvent including ketones such as methyl ethyl ketone, amides, lower alcohols such as ethanol, ethers, and esters, 0.01-5% polyamine such as polyethyleneimine, 1-10% pigment, 3-30% acidic resin having acid number of 10-250 such as acrylic resin. The acidic resin includes those known under the tradename Joncryl 586 and Joncryl 683 which are well known, as found in Mead et al. (col. 11, lines 17-19), as styrene/ $\alpha$ -methylstyrene/acrylic acid copolymers. Further, for specific types of pigments, Zhu et al. refers to Mead et al. which discloses the use of opaque pigments such as titanium dioxide and other organic pigments (col.7, lines 8-39). Zhu et al. further disclose method of printing the ink onto substrate such as glass by ejecting the ink from printer onto the substrate (col.1, lines

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10-12 and 17-24, col.3, lines 32-34, col.4, lines 51-65, col.5, lines 1-13 and 35, col.7, lines 9-16, 32-33, 41, and 46-49, col.8, lines 23-25 and 41, col.9, lines 1, 45-47, and 55-60).

The difference between Zhu et al. and the present claimed invention is the requirement in the claims of hydrophobic conductivity agent.

Elmer et al., which is drawn to ink jet ink, disclose the use of 0.2-3% hydrophobic conductivity agent such as tetrabutylammonium hexafluorophosphate in order to impart sufficient conductivity to the ink so as to allow for the use of ink in continuous ink jet printer (paragraphs 43-45).

In light of the motivation for using hydrophobic conductivity agent disclosed by Elmer et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such conductivity agent in the ink of Zhu et al. in order to produce ink jet ink with conductivity sufficient and effective for printing, and thereby arrive at the claimed invention.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. in view of Mead et al. and Elmer et al. as applied to claims 1-3, 5-18, and 20-24 above, and further in view of Wu et al. (U.S. 2003/0144375).

The difference between Zhu et al. in view of Mead et al. and Elmer et al. and the present claimed invention is the requirement in the claims of Pigment Yellow 139.

Zhu et al. disclose the use of opaque pigments including white pigment such as titanium dioxide.

Wu et al., which is drawn to ink jet inks, disclose the use of Pigment Yellow 139 in order to produce ink with desired color. Further, Wu et al. disclose the equivalence and

interchangeability of white pigment such as titanium dioxide, as disclosed by Zhu et al., with Pigment Yellow 139 as presently claimed (paragraphs 137-138).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use Pigment Yellow 139 in the ink jet ink of Zhu et al. in order to produce yellow ink, and thereby arrive at the claimed invention.

6. Claims 1-11 and 13-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (U.S. 2003/0144375) in view of Mead et al. (U.S. 5,596,027) and Elmer et al. (U.S. 2005/0101694).

Wu et al. disclose ink jet ink comprising water, organic solvent including ethyl alcohol, ethers, esters, and ketones such as methyl ethyl ketone, 0.01-8% pigment including opaque pigment such as Pigment Yellow 139, 0.5-60% acidic resin such as acrylic resin, 0.1-10% polyamine, surfactant, humectant, and conductivity agent. The acidic resin includes that known under the tradename Rhoplex AC-261 which is well known, as found in Mead et al. (col.10, lines 35-37 and col.11, lines 9-13), to possess acid number of 100-250. Wu et al. further disclose method of printing the ink onto substrate such as glass by ejecting the ink from printer onto the substrate (paragraphs 2, 83-84, 86, 130, 137, 140 (line 18), 142, 146, 151-153, 157, 165, 181, and 183-184).

The difference between Wu et al. and the present claimed invention is the requirement in the claims of (a) specific type of conductivity agent, (b) amount of solvent, and (c) specific acrylic resin.

With respect to difference (a), Wu et al. disclose the use of conductivity agent, however, there is no disclosure of hydrophobic conductivity agent as presently claimed.

Elmer et al., which is drawn to ink jet ink, disclose the use of 0.2-3% hydrophobic conductivity agent such as tetrabutylammonium hexafluorophosphate in order to impart sufficient conductivity to the ink so as to allow for the use of ink in continuous ink jet printer (paragraphs 43-45).

In light of the motivation for using hydrophobic conductivity agent disclosed by Elmer et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such conductivity agent in the ink of Wu et al. in order to produce ink jet ink with conductivity sufficient and effective for printing, and thereby arrive at the claimed invention.

With respect to difference (b), although there is no explicit disclosure of the amount of solvent used, Wu et al. do disclose that the amount of solvent depends on many factors including the desired properties of the ink which depends on the type of ink jet printing technology utilized (paragraph 87).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art choose amount of solvent, including that presently claimed, in order to produce ink with desired properties, and thereby arrive at the claimed invention.

With respect to difference (c), Wu et al. disclose the use of acrylic resin known under the tradename Rhoplex AC-261.

Mead et al., which is drawn to ink jet, disclose the use of acidic resin such as styrene/ $\alpha$ -methylstyrene/acrylic acid copolymer in order to provide water resistance to ink images. Mead et al. further disclose the equivalence and interchangeability of acidic resin known under the

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tradename Rhoplex AC-261 as disclosed by Wu et al. with styrene/ $\alpha$ -methylstyrene/acrylic acid as presently claimed.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use styrene/ $\alpha$ -methylstyrene/acrylic acid copolymer in the ink of Wu et al. in order to produce ink images that are water resistant, and thereby arrive at the claimed invention.

7. Claims 1-3, 5, 7, and 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoi et al. (U.S. 2003/0227531) in view of Elmer et al. (U.S. 2005/0101694).

Hosoi et al. disclose ink jet ink comprising water, 0.5-20% opaque pigment, i.e. Pigment Yellow 74 and Pigment Yellow 98, 0.1-10% acidic resin such as acrylic resin, 0.05-20% polyethyleneimine, 1-60% solvent including polyhydric alcohol and ethanol, surfactant, and less than 20% conductivity agent. Hosoi et al. further disclose method of printing the ink onto substrate by ejecting the ink from printer onto the substrate (paragraphs 2, 55, 61, 66-69, 72, 83, 86, 94, 96-98, and 112).

The difference between Hosoi et al. and the present claimed invention is the requirement in the claims of specific conductivity agent.

Elmer et al., which is drawn to ink jet ink, disclose the use of 0.2-3% hydrophobic conductivity agent such as tetrabutylammonium hexafluorophosphate in order to impart sufficient conductivity to the ink so as to allow for the use of ink in continuous ink jet printer (paragraphs 43-45).



In light of the motivation for using hydrophobic conductivity agent disclosed by Elmer et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such conductivity agent in the ink of Hosoi et al. in order to produce ink jet ink with conductivity sufficient and effective for printing, and thereby arrive at the claimed invention.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoi et al. in view of Elmer et al. as applied to claims 1-3, 5, 7, and 12-22 above, and further in view of Santilli et al. (U.S. 5,738,716).

The difference between Hosoi et al. in view of Elmer et al. and the present claimed invention is the requirement in the claims of Pigment Yellow 139.

Hosoi et al. disclose the use of opaque pigments including Pigment Yellow 74, however, there is no disclosure of Pigment Yellow 139.

Santilli et al., which is drawn to ink jet inks, disclose the use of Pigment Yellow 139 in order to produce ink with desired color wherein the pigment does not release toxic byproduct when it degrades. Further, Santilli et al. disclose the equivalence and interchangeability of Pigment Yellow 74, as disclosed by Hosoi et al., with Pigment Yellow 139 as presently claimed (col.2, lines 1-7).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use Pigment Yellow 139 in the ink jet ink of Hosoi et al. in order to produce yellow ink, and thereby arrive at the claimed invention.

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9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoi et al. in view of Elmer et al. as applied to claims 1-3, 5, 7, and 12-22 above, and further in view of Zhu et al. (U.S. 6,221,933)

The difference between Hosoi et al. in view of Elmer et al. and the present claimed invention is the requirement in the claims of specific organic solvent.

Zhu et al., which is drawn to ink jet ink, disclose the use of methyl ethyl ketone in order to improve ink stability and inhibit gel formation (col.4, lines 51-57 and 64-67).

In light of the motivation for using methyl ethyl ketone disclosed by Zhu et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use methyl ethyl ketone in the ink jet ink of Hosoi et al. in order to produce stable ink, and thereby arrive at the claimed invention.

10. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoi et al. in view of Elmer et al. as applied to claims 1-3, 5, 7, and 12-22 above, and further in view of Mead et al. (U.S. 5,596,027).

The difference between Hosoi et al. in view of Elmer et al. and the present claimed invention is the requirement in the claims of specific acidic resin.

Mead et al., which is drawn to ink jet ink, disclose the use of acidic resin with acid number of 100-300 such as styrene/ $\alpha$ -methylstyrene/acrylic acid copolymer in order to produce water resistant image (col.10, lines 21-24 and col.11, lines 16-19).

In light of the motivation for using specific acidic resin disclosed by Mead et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use

styrene/ $\alpha$ -methylstyrene/acrylic acid copolymer in the ink jet ink of Hosoi et al. in order to produce ink that produces water resistant images, and thereby arrive at the claimed invention.

11. Claims 1-11, 13-15, and 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (U.S. 2003/0144375) in view of Mead et al. (U.S. 5,596,027) and Marshall et al. (U.S. 5,275,646)

Wu et al. disclose ink jet ink comprising water, organic solvent including ethyl alcohol, ethers, esters, and ketones such as methyl ethyl ketone, 0.01-8% pigment including opaque pigment such as Pigment Yellow 139, 0.5-60% acidic resin such as acrylic resin, 0.1-10% polyamine, surfactant, humectant, and conductivity agent. The acidic resin includes that known under the tradename Rhoplex AC-261 which is well known, as found in Mead et al. (col.10, lines 35-37 and col.11, lines 9-13), to possess acid number of 100-250. Wu et al. further disclose method of printing the ink onto substrate such as glass by ejecting the ink from printer onto the substrate (paragraphs 2, 83-84, 86, 130, 137, 140 (line 18), 142, 146, 151-153, 157, 165, 181, and 183-184).

The difference between Wu et al. and the present claimed invention is the requirement in the claims of (a) specific type of conductivity agent, (b) amount of solvent, and (c) specific acrylic resin.

With respect to difference (a), Wu et al. disclose the use of conductivity agent, however, there is no disclosure of hydrophobic conductivity agent as presently claimed.

Marshall et al., which is drawn to ink jet ink, disclose the use of 0.5-5% hydrophobic conductivity agent such as tetrabutylammonium tetrafluoroborate in order to impart sufficient

conductivity to the ink so that ink droplets can be directed as desired from ink jet printer to substrate (col.1, lines 19-20 and col.4, lines 43-44 and 52).

In light of the motivation for using hydrophobic conductivity agent disclosed by Marshall et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such conductivity agent in the ink of Wu et al. in order to produce ink jet ink with conductivity sufficient for printing, and thereby arrive at the claimed invention.

With respect to difference (b), although there is no explicit disclosure of the amount of solvent used, Wu et al. do disclose that the amount of solvent depends on many factors including the desired properties of the ink which depends on the type of ink jet printing technology utilized (paragraph 87).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art choose amount of solvent, including that presently claimed, in order to produce ink with desired properties, and thereby arrive at the claimed invention.

With respect to difference (c), Wu et al. disclose the use of acrylic resin known under the tradename Rhoplex AC-261.

Mead et al., which is drawn to ink jet, disclose the use of acidic resin such as styrene/ $\alpha$ -methylstyrene/acrylic acid copolymer in order to provide water resistance to ink images. Mead et al. further disclose the equivalence and interchangeability of acidic resin known under the tradename Rhoplex AC-261 as disclosed by Wu et al. with styrene/ $\alpha$ -methylstyrene/acrylic acid as presently claimed.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use styrene/ $\alpha$ -methylstyrene/acrylic acid copolymer in the ink of Wu et al. in order to produce ink images that are water resistant, and thereby arrive at the claimed invention.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

WO 98/13430 discloses ink jet ink comprising pigment, acidic resin, and organic solvent, however, there is no disclosure of polyamine or hydrophobic conductivity agent as presently claimed.

Yui et al. (U.S. 5,977,207) disclose ink jet ink comprising pigment, carboxyl containing dispersant, polyethyleneimine, and conductivity agent.

Doi et al. (U.S. 6,378,999) disclose ink jet ink comprising pigment, acrylic resin with acid number of 150-800, solvent, polyethyleneimine, and conductivity agent.

Siddiqui et al. (U.S. 6,747,072) disclose white ink comprising organic solvent, opaque pigment, binder, and humectant, however, there is no disclosure of acidic resin, polyamine or hydrophobic conductivity agent as presently claimed.

Zou et al. (U.S. 6,726,756) disclose ink jet ink comprising water, organic solvent, acrylic resin, pigment, and conductivity agent, however, there is no disclosure of polyamine or hydrophobic conductivity agent as presently claimed.

Zhu et al. (U.S. 6,645,280) disclose ink jet ink comprising organic solvent, pigment, and acrylic resin, and conductivity agent, however, there is no disclosure of polyamine or hydrophobic conductivity agent as presently claimed.

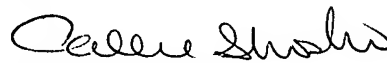
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Zhu et al. (U.S. 2004/0110868) disclose ink jet ink comprising organic solvent, opaque pigment, acidic resin, and hydrophobic conductivity agent, however, there is no disclosure or suggestion of polyamine as presently claimed.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Callie E. Shosho  
Primary Examiner  
Art Unit 1714

CS  
7/9/05